Open Innovation Projects

NASA Challenges through open innovation

http://slsd.jsc.nasa.gov

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Summary

The NASA Open Innovation projects were developed through a strategic planning process in the Space Life Sciences Directorate (SLSD) at NASA's Johnson Space Center. These projects develop challenges that seek innovative solutions to research and technology problems that impact human health and performance in short- and long-duration human spaceflight. The challenges are offered through organizations (InnoCentive and Yet2.com) that offer challenges to a national and international community of potential solvers. A third pilot project was established with TopCoder and Harvard Business School to evaluate an open source code competition. These are pilot projects to determine the effectiveness of open innovation in solving NASA research and technology problems.

History/Overview

The NASA Space Life Sciences developed a strategy in 2007 to pursue alliances external to NASA to establish a balanced internal and external portfolio of research and technology solutions for human health and performance during human space flight. We sought expertise from academia in mapping research and technology needs or gaps to the best possible collaborative strategy; one strategy that clearly emerged was the use of open innovation service providers to seek solutions to challenges external to NASA.

Open innovation was defined by Henry Chesbrough, a professor and executive director at the Center for Open Innovation at UC Berkeley, as "a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology." This open innovation strategy requires NASA to refine problems in the research and technology portfolio into challenge statements that can be addressed by a wide variety of disciplines and technical expertise external to NASA. In this way, we seek to obtain innovative technology, research, service and software code solutions through the extended community. Each pilot project has a different means of seeking and rewarding winning solutions. A challenge also has been posed by the Langley Research Center, and additional NASA centers may participate in the future. At the present time, all three pilot projects have generated tremendous interest and proposed solution submissions are undergoing evaluation.

Later this year, we will have completed the pilot projects and will have recommendations for the further use of open innovation challenges to solve research and technology problems. These recommendations will evaluate the yield of solutions obtained versus the costs of using these open innovation tools (costs may include the actual service cost, time for personnel to be engaged in the process, training time etc) These recommendations could then include useful metrics for the further use and evaluation of these tools. Potential solutions are provided to the government through open innovation service providers using a variety of business models, but all cost much less than traditional methods of seeking research and technology solutions. A second value to this approach is the rapid development, posting and solution time of weeks for finding potential solutions, instead of months or years required using more traditional means.

NASA pursued using open innovation service providers to tap into a large, diverse problem solving network to bring in additional creative ideas to NASA. In management, **Joy's Law** refers to the principle that "No matter who you are, most of the smartest people work for someone else," attributed to Sun Microsystems co-founder Bill Joy.[1] Lakhani KR, Panetta JA (2007). *The Principles of Distributed Innovation*. MIT Press

How this fits into Open Government

In order to use open innovation pilot projects, NASA must be transparent in articulating a current challenge for human spaceflight. These models are inherently participatory as large and diverse communities of solvers around the world may pose a potential solution to a challenge. Depending on the type of pilot project, solvers may collaborate on a solution and/or establish a partnership with NASA to develop the proposed deliverable. These pilot projects greatly diversify the number of potential external collaborators for NASA.

Action Plan / Goals related to Open Government

- 3 months - second round of challenges for two of the pilot projects and lessons learned developed from the first round. These initial lessons learned will include the number of successful solutions obtained, feedback from challenge owners as to the effectiveness and efficiency of the process etc.

- 6 months - executing additional challenges both internal to NASA and externally based on the results of the first pilot projects. This phase could enable better collaboration within NASA in addition to diversifying the number of external solvers working with NASA.

- 1 year - developing contract mechanism to permit open innovation models to be utilized by all NASA centers across a wide variety of challenges and disciplines. If these open innovation tools are successful, we can envision writing a brief how to" guide for the future use of open innovation models within government. In

addition, NASA may consider partnering with an external organization to run challenges of mutual interest.

- 2 years - open innovation services are established as a mechanism for problem solving within NASA. As we learn more about the blend of new models of innovation such as the use of open innovation competitions, we can develop a "system of innovation" that will determine the best application of existing and new tools to solving NASA problems. This system could be captured in contracts, processes, or policy in the future.

Category (*may be more than one*):

x Transparency x Participation x Collaboration

Challenges

- Funding and contractual mechanisms currently limit this experiment to small pilot projects and only two NASA centers.
- Training time for personnel to learn how to use open innovation tools
- Time for personnel to develop, refine, post and evaluate the responses to challenges
- Determining appropriate metrics for the use of open innovation models

Opportunities

Challenges could be offered within NASA and then externally to NASA in a logical sequence. Challenges could be offered by all NASA centers across a wide variety of disciplines and problems.

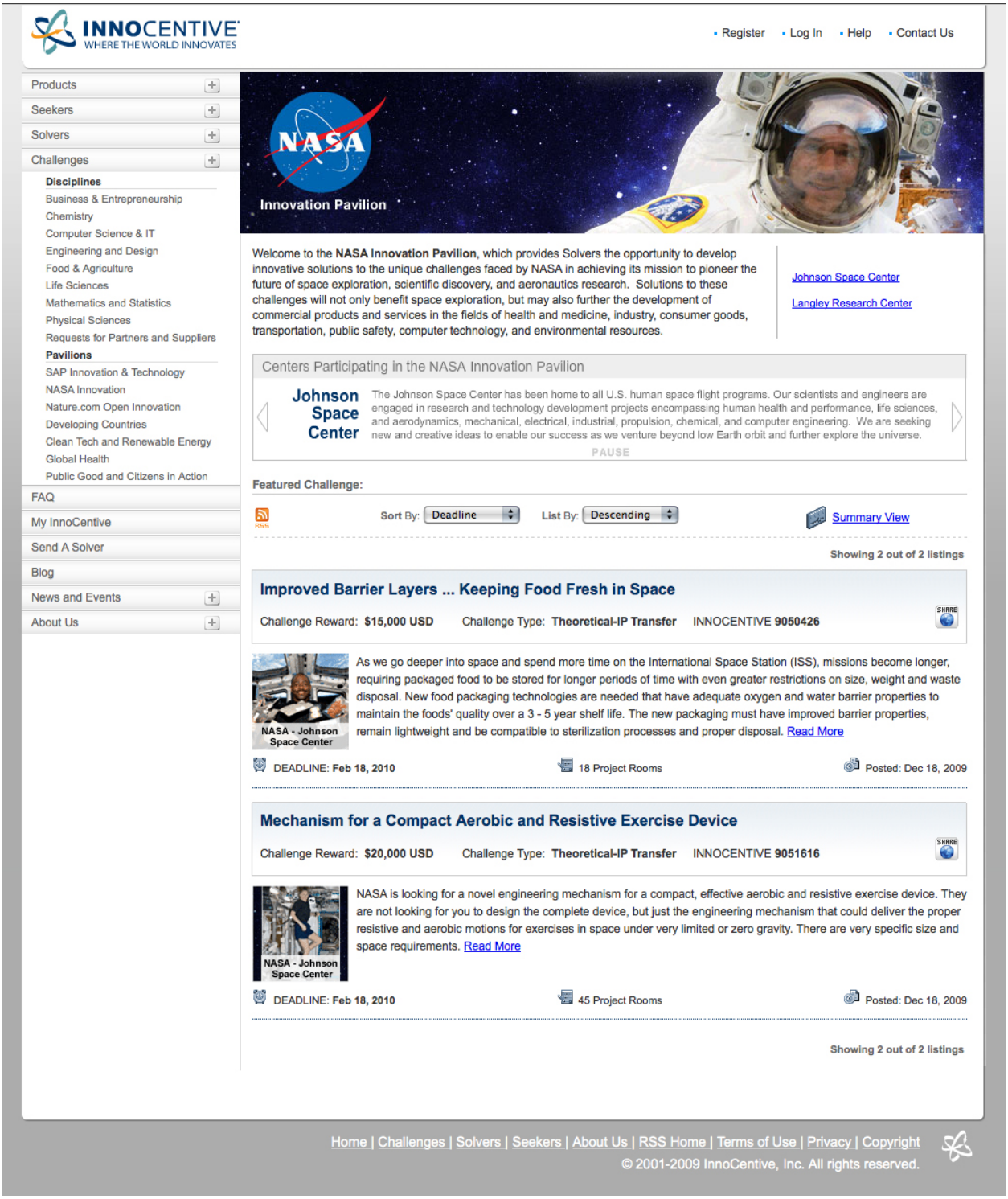
Highlights or Anecdotes

Title 1: Phase I pilot projects

Link 1: http://www.innocentive.com

Description 1 (~100 words):

The first three challenges posted for one of the pilot projects have attracted more than 1,100 potential solvers across 64 countries. These challenges are currently undergoing evaluation for possible winning solutions. As an example, the challenge for a compact exercise device drew over 100 submissions that are undergoing evaluation.



Name of attached Image: NASA pavilion on the InnoCentive website

Title 2: Open source competition

Link 2: http://www.topcoder.com

Description 2 (~100 words):

This open source competition (TopCoder) resulted in the writing of 3,500 lines of code and drew more than 1,800 entrants for the posted NASA challenge. These results are also currently undergoing evaluation.

Name of attached Image:

Useful Links *(Please provide five useful links directing the viewer to information about your project, data generated by your project, or participation opportunities)*:

1. http://slsd.jsc.nasa.gov
2. http://www.innocentive.com
3. http://www.yet2.com/app/about/home
4. http://www.topcoder.com
5. http://drfd.hbs.edu/fit/public/facultyInfo.do?facInfo=ovr&facId=240491